

## Financial Innovation, Banking System and Housing Market.

Lauretta, Eliana; Mazzocchi, Andrea ; Raberto, Marco; Cincotti, Silvano

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# Financial Innovation, Securitisation and Housing Market: an Agent-Based Approach

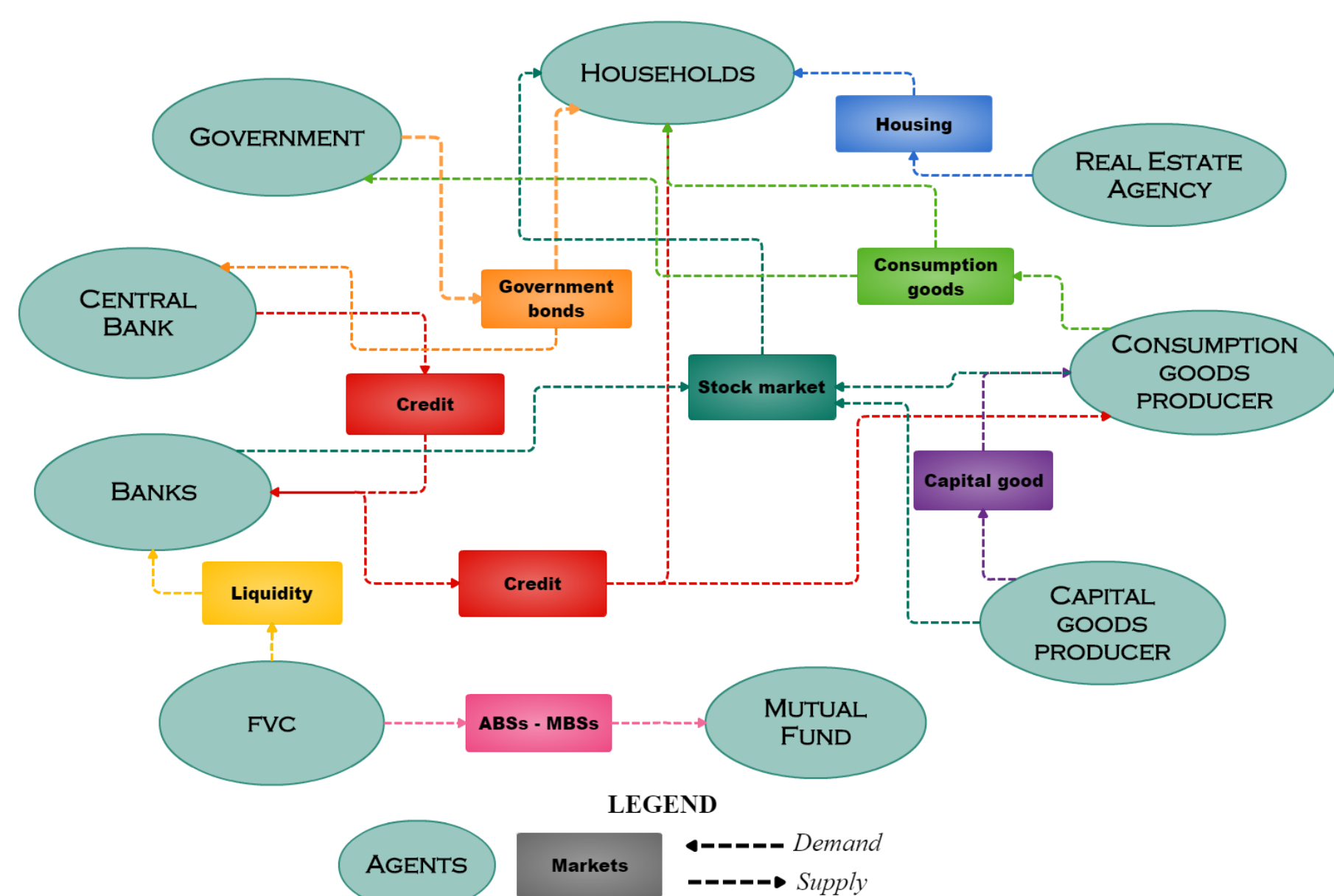
E. Lauretta<sup>a</sup>, A. Mazzocchi<sup>b</sup>, M. Raberto<sup>b</sup>, S. Cincotti<sup>b</sup>

<sup>a</sup>University of Birmingham <sup>b</sup>University of Genoa

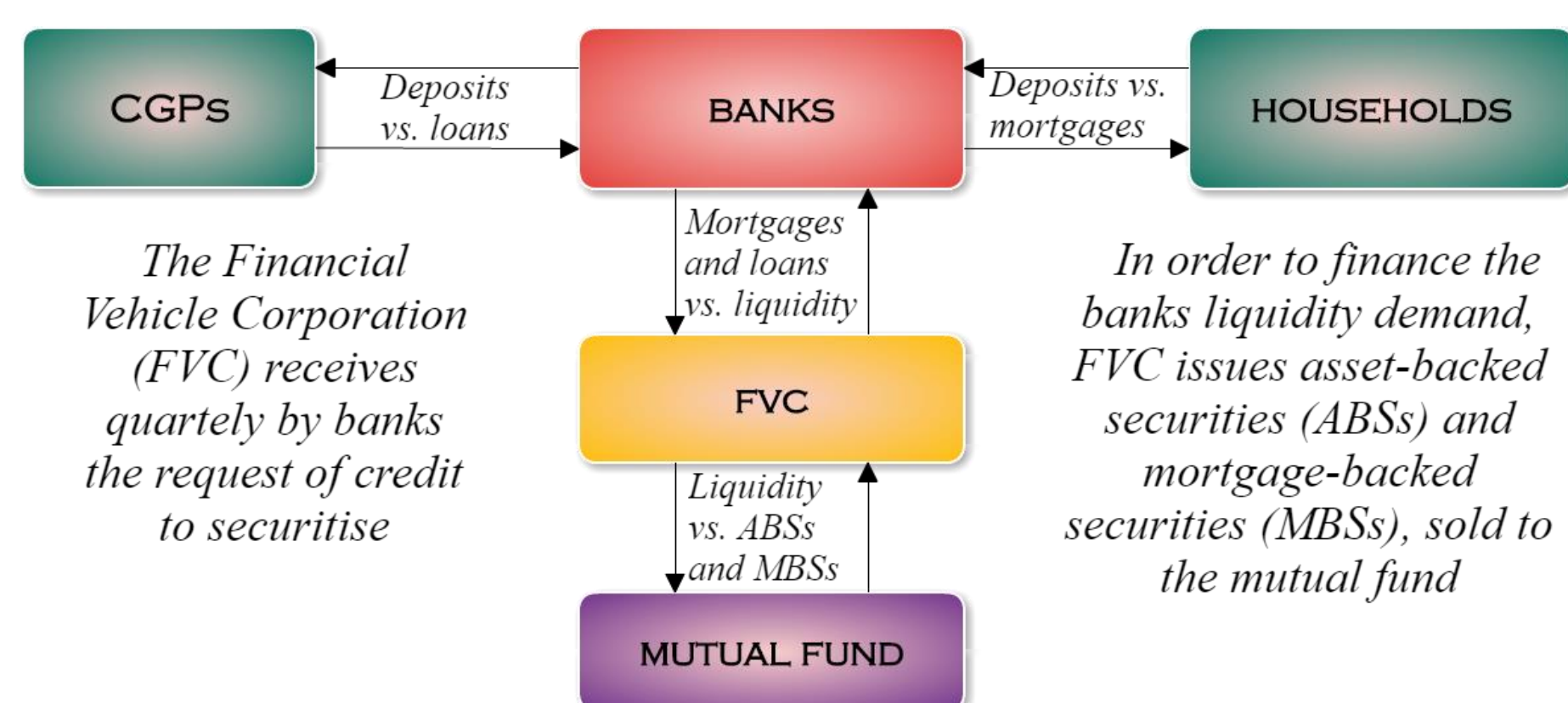
## Motivation and Research Question

- The study argues that an excessive **rate of financial innovation (RoFIN)** has triggered the global financial crisis (Lauretta, 2017, *forthcoming*).
- RoFIN can create positive or negative externalities producing amplified positive or negative financial effects that can impact on the business cycle.
- How to capture the RoFIN amplifying mechanism and model it?
- We model RoFIN as an endogenous variable which amplifies the endogenous money/credit creation.
- We use **EURACE** (e.g. Cincotti et al., 2010; Raberto et al., 2012; Mazzocchi et al., 2016) agent-based and stock-flow consistent macroeconomic model and simulator, which includes several agents who act by following behavioural rules and interact among themselves through different markets.
- EURACE includes a **housing market and a securitisation process**, allowing the study of RoFIN as an endogenous variable, which is captured in the model by a change in the **debt-to-service-income (DSTI) ratio**, a flow control measure of mortgage lending by banks to households.

## EURACE Agent-Based and Stock-Flow Consistent Macroeconomic Model and Simulator



## Securitisation Process



## Securitisation Propensity

Banks are characterized by a securitisation propensity  $\mu$  (between 0 and 1). Quarterly, depending on its securitisation propensity, banks check for credit to be securitised and determine the amount of risk weighted asset to securitise  $S_b^*$  as

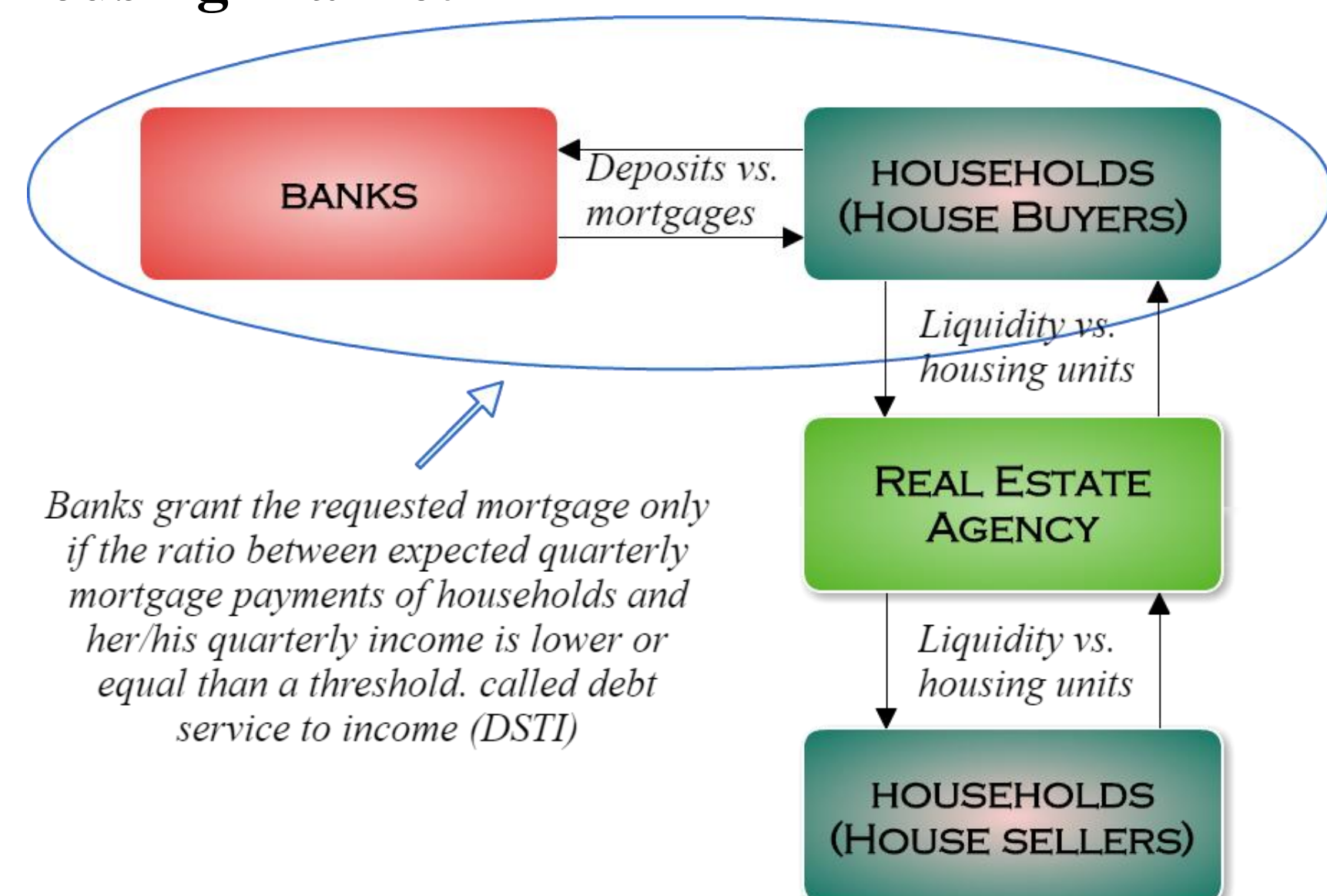
$$S_b^* = \begin{cases} W_b - (1-\mu)\alpha E_b & \text{if } (1-\mu)\alpha E_b < W_b \\ 0 & \text{if } (1-\mu)\alpha E_b \geq W_b \end{cases}$$

$W_b$ : Bank  $b$  risk weighted asset portfolio

$E_b$ : Bank  $b$  equity

$\alpha$ : Fraction needed as equity capital by bank  $b$  (Basel II/III capital requirements)

## Housing Market



## Endogenous DSTI and RoFIN

The value of DSTI is endogenous and computed as follow

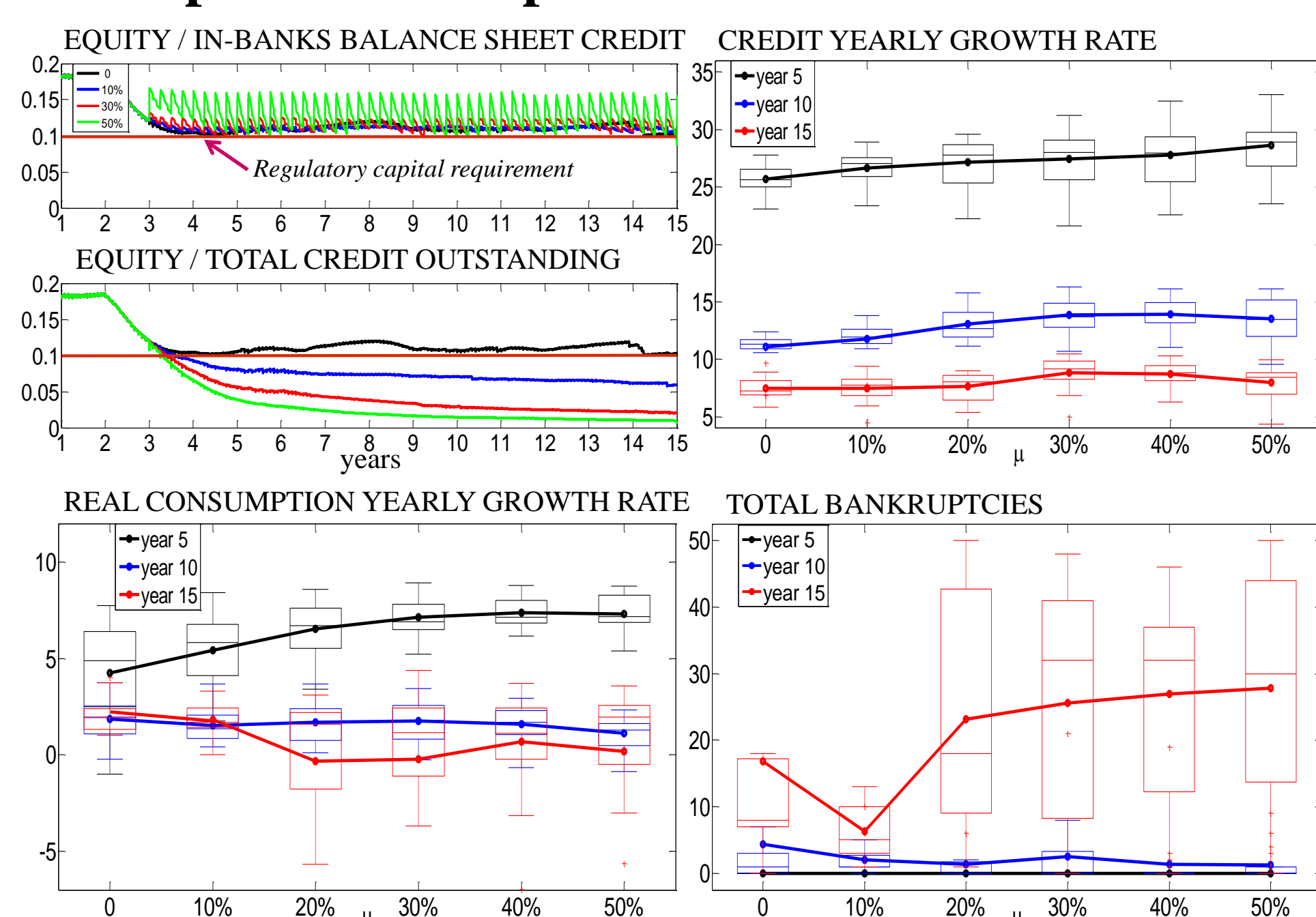
$$DSTI = 0.5 \frac{\varphi_s + \Delta P_{t,t-1}}{\varphi_s + \varphi_H}$$

$\varphi_s$ : maximum percentage price increase of housing price with respect to the previous month market price

$\varphi_H$ : maximum fire sale price reduction

$\Delta P_{t,t-1}$ : housing price monthly growth rate

## Computational Experiments



## Conclusions and Future Research

- The **securitisation propensity** modifies indirectly the **DSTI**, which reflects the **households' creditworthiness** conditions required by the banking system to grant a mortgage and mirrors the **RoFIN** within the system.
- Banks become able to **overcome the regulatory capital requirements**. The interplay between securitisation and DSTI impact on the credit and business cycles.
- Further research could include the development of a more complex financial architecture and an enrichment of EURACE with a financial R&D sector.